AUTHOR INDEX

Adamski, A. J.: see Krouskop, T. A.
Ahn, B. K., Wolfson, S. K., Jr., Yao, S. J., Liu, C. C., Todd, R. C., and Weiner, S. B.: Hyaluronidase-Bound Membrane as a Biomaterial for Implantable Fuel Cells, 283
Alicandri, F. P.: see Castleman, L. S.
Amoss, D. C.: see Weinstein, A. M.
Amstutz, H. C., and Lodwig, M.: Wear of Polymeric Bearing Materials: The Effects of *In Vivo* Implantation, 25
——, Coulson, W. F., and David, E.: Reconstruction of the Canine Achilles and Patellar Tendons Using Dacron Mesh Silicone Prosthesis. I. Clinical and Biocompatibility Evaluation, 47
——: see Wagner, C. N. J.
——: see Walker, P.
Armeniades, C. D.: see Eskin, S. G.
Bagrodia, S., and Wilkes, G. L.: Effects of Solvent Casting Copolymer Materials as Related to Mechanical Properties, 101
Bagwell, J. G.: see Klawitter, J. J.
Baldwin, C. M., and Mackenzie, J. D.: Flame-Sprayed Alumina on Stainless Steel for Possible Prosthetic Application, 445
Black, J.: Dead or Alive: The Problem of *in vitro* Tissue Mechanics, 377
Blackwell, R.: see Pilliar, R. M.
Bonawit, V. L.: see Castleman, L. S.
Brady, J. M., and Cutright, D. E.: Osteogenesis in Ceramic Implantation—A Radioisotope Study, 977
Brash, J. L., Brophy, J. M., and Feuerstein, I. A.: Adhesion of Platelets of Artificial Surfaces: Effect of Red Cells, 429
Brophy, J. M.: see Brash, J. L.
Brown, J. F., Jr.: see Fromageot, H. P. M.
Brown, S. A.: see Collier, J. P.
Buchinger, R.: see Griss, P.
Butruille, Y. A., Savitz, S. R., Leonard, E. F., and Litwak, R. S.: Transient Diffusion Effects in the Study of Early Platelet Adhesion, 145
Cameron, H. U., and Fornasier, V. L.: The Bone–Metal Interface Following Hip Nailing, 769
——, Pilliar, R. M., and Macnab, I.: The Rate of Bone Ingrowth into Porous Metal, 295
——: see Pilliar, R. M.
Cannon, S. L.: see Freitag, T. A.
Carr, S. H.: see Watts, D. R.
Carter, D. R.: see Hayes, W. C.
Castleman, L. S., Motzkin, S. M., Alicandri, F. P., Bonawit, V. L., and Johnson, A. A.: Biocompatibility of Nitinol Alloy as an Implant Material, 695
Cestero, H. J., Jr.: see Lozano, A. J.
Chahal, R.: see Robertson, D. M.
Chalian, V. A.: see Habal, M. B.
Chartoff, R. P.: see Liebert, T. C.
Chen, C. P. W., and Greener, E. H.: A Calculation Relating Galvanism and Marginal Breakdown, 971
Clark, A. E., Hench, L. L., and Paschall, H. A.: The Influence of Surface Chemistry on Implant Interface Histology: A Theoretical Basis for Implant Materials Selection, 161
Cleveland, T. W.: see Weinstein, A. M.
Cohen, I. K., Diegelmann, R. F., and Wise, W. S.: Biomaterials and Collagen Synthesis, 965
Collier, J. P., Colligan, G. A., and

Brown, S. A.: Bone Ingrowth into Dynamically Loaded Porous-Coated Intramedullary Nails, 485
Colligan, G. A.: see Collier, J. P.
Coogan, P.: see Esclas, F.
Cosgrove, S. L.: see Liebert, T. C.
Coulson, W. F.: see Amstutz, H. C.
Cuddihy, E. F., Moacanin, J., Roschke, E. J., and Harrison, E. C.: *In vivo* Degradation of Silicone Rubber Poppets in Prosthetic Heart Valves, 471
Cutright, D. E.: see Brady, J. M.
David, E.: see Amstutz, H. C.
de Wijn, J. R.: Poly(methyl Methacrylate)–Aqueous Phase Blends: *In situ* Curing Porous Materials, 625
Diegelmann, R. F.: see Cohen, I. K.
Dörre, E., Geduldig, D., Happel, M., Lade, R., Prüssner, P., Willert, H.-G., and Zichner, L.: Animal Studies on Bone Ingrowth Kinetics of Ceramic Material Under Dynamic Stress, 493
Escalas, F., Galante, J., Rostoker, W., and Coogan, P.: Biocompatibility of Materials for Total Joint Replacement, 175
Eskin, S.: see Ross, J. N.
Eskin, S. G., Armeniades, C. D., Lie, J. T., Trevino, L., and Kennedy, J. H.: Growth of Cultured Calf Aortic Smooth Muscle Cells on Cardiovascular Prosthetic Materials, 113
Exner, J.: see Šprincl, L.
Feuerstein, I. A.: see Brash, J. L.
Fitzgerald, C. R.: see Hogen-Esch, T. E.
Flemming, W. R.: see Spector, M.
Fornasier, V. L.: see Cameron, H. U.
Freitag, T. A., and Cannon, S. L.: Fracture Characteristics of Acrylic Bone Cements. I. Fracture Toughness, 805
Fromageot, H. P. M., Groves, J. N., Sears, A. R., and Brown, J. F., Jr.: The Interaction of Macromolecular Solutions with Macromolecular Monolayers Adsorbed on a Hydrophobic Surface, 455
Fu, J. C., Hagemeir, C., Moyer, D. L., and Ng, E. W.: A Unified Mathematical Model for Diffusion from Drug–Polymer Composite Tablets, 743
Gachter, A., Galante, J., and Rostoker, W.: $MP_{35}N$: A Corrosion-Resistant, High-Strength Alloy for Orthopedic or Surgical Implants: Two-Year Bioassay Results, 829
Galante, J.: see Escalas, F.
——: see Gachter, A.
Galante, J. O.: see Miller, H. L.
——: see Rostoker, W.
Geduldig, D.: see Dörre, E.
Gifford, G. H., Jr., Merrill, E. W., and Morgan, M. S.: *In vitro* Tissue Reactivity of Radiation-Cured Silicone Rubber Implants, 857
Greenberg, A. R., and Kamel, I.: Polymer–Ceramic Composite for Tooth-Root Implant, 777
Greener, E. H.: see Chen, C. P. W.
Greenspan, D. C., and Hench, L. L.: Chemical and Mechanical Behavior of Bioglass-Coated Alumina, 503
——: see Griss, P.
Griss, P., Greenspan, D. C., Heimke, G., Krempien, B., Buchinger, L., Hench, L. L., and Jentschura, G.: Evaluation of a Bioglass-Coated Al_2O_3 Total Hip Prosthesis in Sheep, 511
——, Silber, R., Merkle, B., Haehner, K., Hemike, G., and Krempien, B.: Biomechanically Induced Tissue Reactions after Al_2O_3–Ceramic Hip Joint Replacement. Experimental and Early Clinical Results, 519
Gristina, A. G., Rovere, G. D., Shoji, H., and Nicastro, J. F.: An *in vitro* Study of Bacterial Response to Inert and Reactive Metals and to Methyl Methacrylate, 273
——: see Shoji, H.

Groves, J. N.: see Fromageot, H. P. M.
Habal, M. B., and Chalian, V. A.: Prefabricated Silicone Subdermal Mandibular Implants: Observations and Problems Related to their Application, 529
——: see Leake, D. L.
Haehner, K.: see Griss, P.
Hagemeir, C.: see Fu, J. C.
Happel, M.: see Dörre, E.
Harrison, E. C.: see Cuddihy, E. F.
Hayes, W. C., and Carter, D. R.: Post-yield Behavior of Subchondral Trabecular Bone, 537
——: see Wright, T. M.
Heimke, G.: see Griss, P.
Hench, L. L.: see Clark, A. E.
——: see Greenspan, D. C.
——: see Griss, P.
——: see Johnson, P. F.
Hersh, L. S.: see Ko, R. Y. C.
Hines, A. L.: see Timmons, C. F.
Hochman, R. F.: see Marek, M.
Hogen-Esch, T. E., Shah, K. R., and Fitzgerald, C. R.: Development of Injectable Poly(glyceryl Methacrylate) Hydrogels for Vitreous Prosthesis, 975
Hohf, R. P.: see Watts, D. R.
Jacobs, J. J.: see Lautenschlager, E. P.
Jentschura, G.: see Griss, P.
Johnson, A. A.: see Castleman, L. S.
Johnson, P. F., and Hench, L. L.: An *in vitro* Model for Evaluating Neural Stimulating Electrodes, 907
Kaganov, A. L., Štamberg, J., and Synek, P.: Hydrophilized Polyethylene Catheters, 1
Kambic, H. E., Kiraly, R. J., and Nosé, Y.: A Simple *in vitro* Screening Test for Blood Compatibility of Materials, 561
Kamel, I.: see Greenberg, A. R.
Kennedy, J. H.: see Eskin, S. G.
Kiraly, R. J.: see Kambic, H. E.
Klawitter, J. J., Bagwell, J. G., Weinstein, A. M., Sauer, B. W., and Pruitt, J. R.: An Evaluation of Bone Growth into Porous High Density Polyethylene, 311
——: see Weinstein, A. M.
Ko, R. Y. C., and Hersh, L. S.: A Dacron Wool Packed-Bed Extracorporeal Reactor: A Kinetics Study of Immobilized *Escherichia coli* II L-asparaginase, 249
Kopeček, J.: see Šprincl, L.
Korostoff, E.: see Sutow, E. J.
Kouzelos, J.: see McMaster, W. C.
Krempien, B.: see Griss, P.
Kreutner, A.: see Spector, M.
Krouskop, T. A., Trono, R., and Adamski, A. J.: The Effects of Pylon Shape on Bone–Pylon Interface Performance in Direct Skeletal Attachment, 345
Kusy, R. P., Mahan, J. R., and Turner, D. T.: Influence of Application Technique on Microstructure and Strength of Acrylic Restorations, 77
Lade, R.: see Dörre, E.
Lautenschlager, E. P., Jacobs, J. J., Marshall, G. W., and Meyer, P. R., Jr.: Mechanical Properties of Bone Cements Containing Large Doses of Antibiotic Powders, 929
——, Marshall, G. W., Marks, K. E., Schwartz, J., and Nelson, C. L.: Mechanical Strength of Acrylic Bone Cements Impregnated with Antibiotics, 837
Leake, D. L., and Habal, M. B.: Craniofacial Contour Defect Reconstruction with a Dacron/Urethane Composite: An Alloplastic Tray for Bone Induction Fabrication and Application, 555
Lemons, J. E., Niemann, K. M. W., and Weiss, A. B.: Biocompatibility Studies on Surgical-Grade Titanium-, Cobalt-, and Iron-Base Alloys, 549
Leonard, E. F.: see Butruille, Y. A.
Liddle, S.: see McMaster, W. C.

Lie, J. T.: see Eskin, S. G.
Liebert, T. C., Chartoff, R. P., Cosgrove, S. L., and McCuskey, R. S.: Subcutaneous Implants of Polypropylene Filaments, 939
Lightsey, G. R.: see Timmons, C. F.
Litwak, R. S.: see Butruille, Y. A.
Liu, C. C.: see Ahn, B. K.
Locke, H.: see Salzer, M.
Lodwig, M.: see Amstutz, H. C.
Lozano, A. J., Cestero, H. J., Jr., and Salyer, K. E.: A Comparative Study of the Early Vascularization of Porous Carbon and Bone as a Graft, 545
Mackenzie, J. D.: see Baldwin, C. M.
Macnab, I.: see Cameron, H. U.
——: see Pilliar, R. M.
Mahan, J. R.: see Kusy, R. P.
Malhotra, M. L.: Microstructure in Gold-Containing Ag_3Sn-Amalgam, 9
Malkin, D.: see Pugh, J.
Marek, M., Hochman, R. F., and Okabe, T.: *In vitro* Corrosion of Dental Amalgam Phases, 789
Marks, K. E.: see Lautenschlager, E. P.
Marshall, G. W.: see Lautenschlager, E. P.
Matlaga, B. F., Yasenchak, L. P., and Salthouse, T. N.: Tissue Response to Implanted Polymers: The Significance of Sample Shape, 391
McCuskey, R. S.: see Liebert, T. C.
McMaster, W. C., Kouzelos, J., Liddle, S., and Waugh, T. R.: Tendon Grafting with Glutaraldehyde Fixed Material, 259
Meachim, G.: see Owen, R.
Merkle, B.: see Griss, P.
Merrill, E. W.: see Gifford, G. H., Jr.
——: see Sefton, M. V.
Meyer, P. R., Jr.: see Lautenschlager, E. P.
Miegel, R. E.: see Townsend, P. R.
Miller, H. L., Rostoker, W., and Galante, J. O.: A Statistical Treatment of Fatigue of the Cast Co-Cr-Mo Prosthesis Alloy, 399
Moacanin, J.: see Cuddihy, E. F.
Moidel, R. A., Wolfson, S. K., Jr., Selker, R. G., and Weiner, S. B.: Materials for Selective Tissue Heating in a Radiofrequency Electromagnetic Field for the Combined Chemothermal Treatment of Brain Tumors, 327
Morgan, M. S.: see Gifford, G. H., Jr.
Motzkin, S. M.: see Castleman, L. S.
Moyer, D. L.: see Fu, J. C.
Nelson, C. L.: see Lautenschlager, E. P.
Ng, E. W.: see Fu, J. C.
Nicastro, J. F.: see Gristina, A. G.
——: see Shoji, H.
Niemann, K. M. W.: see Lemons, J. E.
Noishiki, Y.: Biochemical Response to Dacron Vascular Prosthesis, 759
Normann, N. A.: see Ross, J. N.
Nosé, Y.: see Kambic, H. E.
Okabe, T.: see Marek, M.
——: see Timmons, C. F.
Owen, R., Meachim, G., and Williams, D. F.: Hair Sampling for Chromium Content Following Charnley Hip Arthroplasty, 91
Paschall, H. A.: see Clark, A. E.
Pilliar, R. M., Blackwell, R., Macnab, I., and Cameron, H. U.: Carbon Fiber-Reinforced Bone Cement in Orthopedic Surgery, 893
——: see Cameron, H. U.
Pollack, S. R.: see Sutow, E. J.
Privitzer, E.: see Widera, G. E. O.
Pruitt, J. R.: see Klawitter, J. J.
Prüssner, P.: see Dörre, E.
Pugh, J., Weiss, C., Weiss, F., and Malkin, D.: Design and Biomechanical Evaluation of a Cementable Endosteal Blade Implant, 571
Punzet, G.: see Salzer, M.
Radin, E. L.: see Townsend, P. R.
Raux, P.: see Townsend, P. R.
Robertson, D. M., St. Pierre, L., and

Chahal, R.: Preliminary Observations of Bone Ingrowth into Porous Materials, 335
Roggendorf, E.: The Biostability of Silicone Rubbers, a Polyamide, and a Polyester, 123
Roschke, E. J.: see Cuddihy, E. F.
Rose, R. M.: see Townsend, P. R.
Ross, J. N., Wright, J. T. M., Eskin, S., von Koch, L., and Normann, N. A.: Oxidized Orlon as a Blood Interface, 583
Rostoker, W., and Galante, J. O.: Some New Studies of the Wear Behavior of Ultrahigh Molecular Weight Polyethylene, 303
——: see Escalas, F.
——: see Gachter, A.
——: see Miller, H. L.
Rovere, G. D.: see Gristina, A. G.
——: see Shoji, H.
Rubinfeld, M.: see Walker, P.
Salthouse, T. N.: Cellular Enzyme Activity at the Polymer–Tissue Interface: A Review, 197
——: see Matlaga, B. F.
Salyer, K. E.: see Lozano, A. J.
Salzer, M., Zweymüller, K., Locke, H., Zeibig, A., Stärk, N., and Punzet, G.: Further Experimental and Clinical Experience with Aluminum Oxide Endoprostheses, 847
Sanders, A. E.: see Schmerling, M. A.
Sauer, B. W.: see Klawitter, J. J.
——: see Spector, M.
Savitz, S. R.: see Butruille, Y. A.
Schmerling, M. A., Wilkov, M. A., Sanders, A. E., and Woosley, J. E.: Using the Shape Recovery of Nitinol in the Harrington Rod Treatment of Scoliosis, 879
Schurman, D. J.: see Wagner, C. N. J.
Schwartz, J.: see Lautenschlager, E. P.
Sears, A. R.: see Fromageot, H. P. M.
Sefton, M. V., and Merrill, E. W.: Surface Hydroxylation of Styrene–Butadiene–Styrene Block Copolymers for Biomaterials, 33
Selker, R. G.: see Moidel, R. A.
Shabaik, A. H.: see Wagner, C. N. J.
Shah, K. R.: see Hogen-Esch, T. E.
Shoji, H., Nicastro, J. F., Rovere, G. D., and Gristina, A. G.: *In vitro* Effects of Bone Cement on *S. aureus* Growth and Phagocytosis and Glucose Metabolism of Macrophage: A Preliminary Study, 733
——: see Gristina, A. G.
Silber, R.: see Griss, P.
Spector, M., Flemming, W. R., Kreutner, A., and Sauer, B. W.: Bone Growth into Porous High-Density Polyethylene, 595
Šprincl, L., Exner, J., Štěrba, O., and Kopeček, J.: New Types of Synthetic Infusion Solutions. III. Elimination and Retention of Poly[*N*-(2-hydroxypropyl)Methacrylamide] in a Test Organism, 953
St. Pierre, L.: see Robertson, D. M.
Stamberg, J.: see Kaganov, A. L.
Stärk, N.: see Salzer, M.
Štěrba, O.: see Šprincl, L.
Stewart, G. P., and Wilkov, M. A.: Mechanism of Failure of Biocompatible-Treated Surfaces, 413
Sutow, E. J., Pollack, S. R., and Korostoff, E.: An *in vitro* Investigation of the Anodic Polarization and Capacitance Behavior of 316-L Stainless Steel, 671
Synek, P.: see Kaganov, A. L.
Tesk, J. A.: see Widera, G. E. O.
Timmons, C. F., Hines, A. L., Lightsey, G. R., and Okabe, T.: Diffusion of Mercury in Ag_2Hg_3 from Weight-Loss Data, 371
Todd, R. C.: see Ahn, B. K.
Townsend, P. R., Miegel, R. E., Rose, R. M., Raux, P., and Radin, E. L.: Structure and Function of the Hu-

man Patella: The Role of Cancellous Bone, 605
Trevino, L.: see Eskin, S. G.
Trono, R.: see Krouskop, T. A.
Turner, D. T.: see Kusy, R. P.
von Koch, L.: see Ross, J. N.
Wagner, C. N. J., Shabaik, A. H., Schurman, D. J., and Amstutz, H. C.: Preparation and Characterization of Wear Debris of Orthopedic Materials for Biocompatibility Studies, 653
Walker, P., Amstutz, H. C., and Rubinfeld, M.: Canine Tendon Studies. II. Biomechanical Evaluation of Normal and Regrown Canine Tendons, 61
Watts, D. R., Carr, S. H., and Hohf, R. P.: Poly(glycolic Acid) Structures in Canine Vascular Anastomoses, 867
Waugh, T. R.: see McMaster, W. C.
Weiner, S. B.: see Ahn, B. K.
——: see Moidel, R. A.
Weinstein, A. M., Klawitter, J. J., Cleveland, T. W., and Amoss, D. C.: Electrical Stimulation of Bone Growth into Porous Al_2O_3, 231
——: see Klawitter, J. J.
Weiss, A. B.: see Lemons, J. E.
Weiss, C.: see Pugh, J.
Weiss, F.: see Pugh, J.
Widera, G. E. O., Tesk, J. A., and Privitzer, E.: Interaction Effects Among Cortical Bone, Cancellous Bone, and Periodontal Membrane of Natural Teeth and Implants, 613
Wilkes, G. L.: see Bagrodia, S.
Wilkov, M. A.: see Schmerling, M. A.
——: see Stewart, G. P.
Willert, H.-G.: see Dörre, E.
Williams, D. F.: see Owen, R.
Wise, W. S.: see Cohen, I. K.
Wolfson, S. K., Jr.: see Ahn, B. K.
——: see Moidel, R. A.
Woosley, J. E.: see Schmerling, M. A.
Wright, J. T. M.: see Ross, J. N.
Wright, T. M., and Hayes, W. C.: The Fracture Mechanics of Fatigue Crack Propagation in Compact Bone, 637
Yao, S. J.: see Ahn, B. K.
Yasenchak, L. P.: see Matlaga, B. F.
Zeibig, A.: see Salzer, M.
Zichner, L.: see Dörre, E.
Zweymüller, K.: see Salzer, M.

SUBJECT INDEX

Acrylic bone cements, fracture characteristics, 805
mechanical strength of, 837
Acrylic restorations, application techniques on microstructure and strength of, 77
Ag_2Hg_3, diffusion of mercury in, 371
Ag_3Sn-amalgam, microstructure in gold-containing, 9
Alumina, chemical and mechanical behavior of bioglass-coated, 503
flame-sprayed, 445
Aluminum oxide endoprosthesis, 847
Al_2O_3, bioglass-coated, 511
ceramic hip joint replacement, 519
Antibiotics, acrylic bone cements impregnated with, 837
Antibiotic powder in bone cement, mechanical properties of, 929

Biocompatibility studies of surgical-grade cobalt-base alloys, 549
of surgical-grade iron-base alloys, 549
of surgical-grade titanium-base alloys, 549
wear debris of orthopedic materials for, 653
Biocompatible-treated surfaces, mechanism of failure in, 413
Bioglass-coated Al_2O_3 total hip prosthesis in sheep, 511
Biomaterial for implantable fuel cell, hyaluronidase-bound membrane as, 283
Biostability, of a polyamide, 123
of a polyester, 123
of silicone rubber, 123
Blade implant, cementable endosteal, 571
Blood compatability of materials, screening test for, 561
Blood interface, oxidized orlon as, 583
Bone cements, antibiotic powders for, 929
carbon fiber-reinforced, 893
effects on *S. aureus* growth and phagocytosis and glucose metabolism of macrophage, 733
Bone growth, electrical stimulation of, 231
rate into porous metal, 295
Bone growth kinetics, ceramic materials under dynamic stress, 493
Bone ingrowth, into dynamically loaded porous-coated intramedullary nails, 485
into porous high-density polyethylene, 595
into porous materials, 335
into porous metal, 295
Bone–metal interface following hip nailing, 769

Cancellous bone, 605
Canine Achilles, reconstruction of, 47
Canine patellar tendons, reconstruction of, 47
Canine tendons, biomechanical evaluation of, 61
Cardiovascular prosthetic materials, growth of cultured calf aortic smooth muscle cells on, 113
Cast Co-Cr-Mo prosthetic alloy, fatigue of, 399
Catheters, hydrophilized polyethylene, 1
Cellular enzyme activity at polymer–tissue interface, 197

Ceramic implantation, osteogenesis in, 977
Chromium content of hair, 91
Collagen synthesis, 965
Compact bone, fatigue crack propagation in, 637
Craniofacial contour defect reconstruction, 555

Dacron mesh silicone prosthesis, 47
Dacron/urethane composite, craniofacial contour reconstruction, 555
Dacron vascular prosthesis, biochemical response to, 759
Dacron wool packed-bed extracorporeal reactor, 249
Dental amalgam phases, *in vitro* corrosion of, 789
Drug–polymer composite tablets, mathematical model for, 743

Electrical stimulation of bone growth, 231

Fatigue crack propagation in compact bone, 637
Fuel cell, implantable, hyaluronidase-bound membrane as biomaterial for, 283

Galvanism and marginal breakdown, calculation relating, 971
Glucose metabolism of macrophage, effects of bone cement on, 733

Harrington rod, nitinol for, 879
Human patella, structure and function of, 605
Hydrophilized polyethylene catheters, 1
Hydrophobic surface, interaction of macromolecular solutions with, 455

Immobilized *Escherichia coli* II L-asparaginase, kinetic study of, 249
Implant interface histology, influence of surface chemistry on, 161
Implanted polymers, tissue response to, 391
Inert metals, *in vitro* study of bacterial response to, 273
Infusion solutions, polymethacrylamides, 953

Materials for selective radiofrequency tissue heating, 327
Mercury, diffusion of, in Ag_2Hg_3 from weight-loss data, 371
Methyl methacrylate, bacterial response to, 273
$MP_{35}N$, a corrosion-resistant orthopedic alloy, 829

Neural-stimulating electrode, 907
Nitinol alloy, as implant material, 695
Nitinol, use in Harrington rod, 879

Orthopedic implant, $MP_{35}N$ for, 829
Orthopedic materials, wear debris of, 653
Osteogenesis in ceramic implantation, 977
Oxidized orlon as blood interface, 583

Patellar tendons, reconstruction of, 47
Phagocytosis, effects of bone cement on, 733
Platelets, adhesion, to artificial surfaces, 429
  transient diffusion effects, 145
Polyamide, biostability of, 123
Polyester, biostability of, 123
Polyethylene, bone growth into porous high-density, 311, 595
  wear behavior of ultrahigh molecular weight, 303
Poly(glycolic acid) structures in canine vascular anastomosis, 867
Poly(glyceryl methacrylate) hydrogels for vitreous prosthesis, 975
Polymer–ceramic composite for tooth-root implant, 777
Polymer–tissue interface, cellular enzyme activity at, 197

Polymeric bearing materials, *in vivo* implantation on wear of, 21
Polymethacrylamides for infusion solutions, 953
Poly(methyl methacrylate) – aqueous phase blends, 625
Polypropylene filaments, subcutaneous implants of, 939
Porous Al_2O_3, electrical stimulation of bone growth into, 231
Porous carbon, vascularization of, 545
Porous-coated intramedullary nails, bone ingrowth into, 485
Porous high-density polyethylene, bone ingrowth into, 311
Porous materials, bone ingrowth into, 335
Porous metal, rate of bone growth into, 295
Prosthesis, vitreous, injectable poly(glyceryl methacrylate) hydrogels for, 975
Prosthetic heart valves, silicone rubber poppets for, 471
Pylon shape on bone–pylon interface, 345

Reactive metals, *in vitro* study of bacterial response to, 273

S. aureus growth, effects of bone cement on, 733
Silicone rubber, biostability of, 123
Silicone rubber implants, reactivity of radiation-cured, 857
Silicone rubber poppets in prosthetic heart valves, 471
Silicone subdermal mandibular implants, 529
Solvent casting copolymer materials, 101
Stainless steel, 316-L, anodic polarization, 671
  capacitance behavior, 671
Styrene–butadiene–styrene block copolymers, surface hydroxylation of, 33
Subchondral trabecular bone, postyield behavior of, 537
Subcutaneous implants of polypropylene filaments, 939
Surgical-grade cobalt-base alloys, biocompatibility studies, 549
Surgical-grade iron-base alloys, biocompatibility studies, 549
Surgical-grade titanium-base alloys, biocompatibility studies, 549
Surgical implants, $MP_{35}N$ for, 829

Tendon grafting with glutaraldehyde-fixed materials, 259
Tissue mechanics, problem of *in vitro*, 377
Tissue reactions after Al_2O_3 ceramic hip joint replacement, 519
Tooth implants, 613
Tooth-root implant, polymer–ceramic composite for, 777
Total joint replacement, biocompatibility of materials for, 175
Transient diffusion effects in study of platelet adhesion, 145

Journal of BIOMEDICAL MATERIALS Research

VOLUME 10 • 1976

Editor-in-Chief:

Sumner N. Levine
Stony Brook, Long Island, New York

Advisory Editorial Board:

Harlan C. Amstutz
New York, N. Y.

John Autian
Memphis, Tenn.

Silas Braley
Midland, Mich.

Stephen D. Bruck
Bethesda, Md.

Julio C. Davila
Philadelphia, Pa.

Richard D. Falb
Columbus, Ohio

Pierre Galletti
Atlanta, Ga.

Vincent L. Gott
Baltimore, Md.

Harry P. Gregor
New York, N. Y.

N. D. Greene
Storrs, Conn.

C. William Hall
Houston, Tex.

B. David Halpern
Bethayres, Pa.

L. L. Hench
Gainesville, Florida

Samuel F. Hulbert
New Orleans, La.

Adrian Kantrowitz
Brooklyn, N. Y.

J. Lawrence Katz
Troy, N. Y.

W. J. Kolff
Salt Lake City, Utah

Patrick Laing
Pittsburgh, Pa.

Edward F. Leonard
New York, N. Y.

Fred Leonard
Washington, D. C.

Donald Lyman
Menlo Park, Calif.

Edward W. Merrill
Cambridge, Mass.

Yukihiko Nosé
Cleveland, Ohio

H. L. Nossel
New York, N. Y.

Floyd A. Peyton
Ann Arbor, Mich.

R. W. Phillips
Indianapolis, Ind.

Will R. Pierie
Santa Ana, Calif.

Edward I. Salkovitz
Pittsburgh, Pa.

Edwin W. Salzman
Cambridge, Mass.

Lester R. Sauvage
Seattle, Wash.

P. N. Sawyer
Brooklyn, N. Y.

Sigmund Wesolowski
Rockville Centre, N. Y.

O. Wichterle
Prague

H. G. F. Wilsdorf
Charlottesville, Va.

Stephen C. Woodward
Washington, D. C.

an Interscience® Publication

published by **JOHN WILEY & SONS** • NEW YORK • LONDON • SYDNEY • TORONTO

Copyright © 1976 by John Wiley & Sons, Inc.

Statement of ownership, management, and circulation (Act of August 12, 1970; Section 3685 Title 39, United States Code)

1. Title of Publication: Journal of Biomedical Materials Research

2. Date of filing: September 29, 1976

3. Frequency of issue: Bimonthly

3A. Annual Subscription price: $80.00

4. Location of known office of publication: John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016.

5. Location of the headquarters or general business offices of the publisher: John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016

6. Names and addresses of publisher, editor, and managing editor:

Publisher: John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016
Editor: Sumner N. Levine, College of Engineering, State University of New York, Stony Brook, New York 11790
Managing Editor: None

7. Owner: John Wiley & Sons, Inc., 605 Third Avenue, New York, New York, 10016
The following is a list of stockholders owning or holding 1% or more of John Wiley & Sons, Inc. stock as of September 11, 1976.

Cynthia W. Darby, Box 651, Bridgehampton, New York 11932; Hamilton Darby, Box 651, Bridgehampton, New York 11932; Edward P. Hamilton, 605 Third Avenue, New York, New York 10016; W. Bradford Wiley & Francis Lobdell, Trustees, Elizabeth W. Hamilton Trust, 605 Third Avenue, New York, New York 10016; Edward P. Hamilton, Trustee under will of Elizabeth Wiley Hamilton, c/o Gifford, Woody, Carter & Hays, 1 Wall Street, New York, New York 10005; Eric S. Proskauer & Charles H. Lieb, Trustees u/a by Jenny R. Proskauer, 220 Central Park South, New York, New York 10019; Francis Lobdell and W. Bradford Wiley, Trustees f/b/o Deborah Elizabeth Wiley, c/o John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016; Cynthia W. Darby & Julia Gilbert, Trustees under will of Kate R. Q. Wiley, c/o Gifford, Woody, Carter & Hays, 1 Wall Street, New York, New York 10005; Francis Lobdell and W. Bradford Wiley, Trustees f/b/o Peter Booth Wiley, c/o John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016; Francis Lobdell & W. Bradford Wiley, Trustees f/b/o William Bradford Wiley II, c/o John Wiley & Sons, Inc., 605 Third Avenue, New York, New York 10016; Edward P. Hamilton & Cynthia Wiley Darby, Trustees under will of William O. Wiley, c/o Gifford, Woody, Carter & Hays, 1 Wall Street, New York, New York 10005; Adele E. Windheim, 8 Dundee Road, Larchmont, New York; Mrs. Rosamond R. Pennywitt, 49 Bristol Place, Bay Head, New Jersey 08742; Drexel Burnham & Co., 60 Broad Street, New York, New York; Bankers Trust Company, 16 Wall Street, New York, New York 10005; National Bank of Detroit, Woodward Avenue, Detroit, Michigan; Riggs National Bank of Washington, D.C., 1508 H Street, N.W., Washington, D.C.; Manufacturers Hanover Trust Company, 350 Park Avenue, New York, New York 10022; Bank of New York, P.O. Box 11 203, New York, New York 10049; Morgan Guaranty Trust Company, 23 Wall Street, New York, New York 10005; Bradford Trust Company, 95 Wall Street, New York, New York 10005; National Commercial Bank & Trust Co., 60 State Street, Albany, New York 12207; Wells Fargo Bank, San Francisco, California 94144; Midland National Bank, 401 Second Avenue South, Minneapolis, Minnesota 55480; W. Bradford Wiley, 605 Third Avenue, New York, New York 10016.

8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities: None

9. Not applicable.

10. Extent and nature of circulation

	Average no. copies each issue during preceding 12 months	Actual number of copies of single issue published nearest to filing date
A. Total no. copies printed (*net press run*)	1350	1350
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	—	—
2. Mail subscriptions	983	983
C. Total paid circulation (*sum of 10B1 and 10B2*)	983	983
D. Free distribution by mail, carrier or other means, samples, complimentary, and other free copies	58	58
E. Total distribution (*sum of C and D*)	1041	1041
F. Copies not distributed		
1. Office use, left-over, unaccounted, spoiled after printing	309	309
2. Returns from news agents	—	—
G. Total (*sum of E, F1 and 2—should equal net press run shown in A*)	1350	1350

11. I certify that the statements made by me above are correct and complete. (Signature of editor, publisher, business manager, or owner) ALLAN WITTMAN, Publisher

12. For completion by publishers mailing at the regular rates (Section 132.121 Postal Service Manual)
39 U.S.C. 3626 provides in pertinent part: "No person who would have been entitled to mail matter under former section 4359 of this title shall mail such matter at the rates provided under this subsection unless he files annually with the Postal Service a written request for permission to mail matter at such rates." In accordance with the provisions of this statute, I hereby request permission to mail the publication named in Item 1 at the phased postage rates presently authorized by 39 U.S.C. 3626.

(Signature and title of editor, publisher, business manager, or owner) ALLAN WITTMAN, Publisher

Journal of Biomedical Materials Research

CONTENTS

Vol. 10, Issue Nos. 1—6, 1976

Issue No. 1, January

A. L. Kaganov, J. Štamberg, and P. Synek: Hydrophilized Polyethylene Catheters 1

M. L. Malhotra: Microstructure in Gold-Containing Ag_3Sn-Amalgam .. 9

H. C. Amstutz and M. Lodwig: Wear of Polymeric Bearing Materials: The Effects of *In Vivo* Implantation 25

M. V. Sefton and E. W. Merrill: Surface Hydroxylation of Styrene–Butadiene–Styrene Block Copolymers for Biomaterials 33

H. C. Amstutz, W. F. Coulson, and E. David: Reconstruction of the Canine Achilles and Patellar Tendons Using Dacron Mesh Silicone Prosthesis. I. Clinical and Biocompatibility Evaluation 47

P. Walker, H. C. Amstutz, and M. Rubinfeld: Canine Tendon Studies. II. Biomechanical Evaluation of Normal and Regrown Canine Tendons 61

R. P. Kusy, J. R. Mahan, and D. T. Turner: Influence of Application Technique on Microstructure and Strength of Acrylic Restorations ... 77

R. Owen, G. Meachim, and D. F. Williams: Hair Sampling for Chromium Content Following Charnley Hip Arthroplasty 91

S. Bagrodia and G. L. Wilkes: Effects of Solvent Casting Copolymer Materials as Related to Mechanical Properties 101

S. G. Eskin, C. D. Armeniades, J. T. Lie, L. Trevino, and J. H. Kennedy: Growth of Cultured Calf Aortic Smooth Muscle Cells on Cardiovascular Prosthetic Materials 113

E. Roggendorf: The Biostability of Silicone Rubbers, a Polyamide, and a Polyester 123

Y. A. Butruille, S. R. Savitz, E. F. Leonard, and R. S. Litwak: Transient Diffusion Effects in the Study of Early Platelet Adhesion 145

Issue No. 2, March

A. E. Clark, L. L. Hench, and H. A. Paschall: The Influence of Surface Chemistry on Implant Interface Histology: A Theoretical Basis for Implant Materials Selection 161

F. Escalas J. Galante, W. Rostoker, and P. Coogan: Biocompatibility of Materials for Total Joint Replacement 175

T. N. Salthouse: Cellular Enzyme Activity at the Polymer–Tissue Interface: A Review 197

A. M. Weinstein, J. J. Klawitter, T. W. Cleveland, and D. C. Amoss: Electrical Stimulation of Bone Growth into Porous Al_2O_3 231

R. Y. C. Ko and L. S. Hersh: A Dacron Wool Packed-Bed Extracorporeal Reactor: A Kinetic Study of Immobilized *Escherichia coli* II L-asparaginase 249

W. C. McMaster, J. Kouzelos, S. Liddle, and T. R. Waugh: Tendon Grafting with Glutaraldehyde Fixed Material 259

A. G. Gristina, G. D. Rovere, H. Shoji, and J. F. Nicastro: An *in vitro* Study of Bacterial Response to Inert and Reactive Metals and to Methyl Methacrylate 273

B. K. Ahn, S. K. Wolfson, Jr., S. J. Yao, C. C. Liu, R. C. Todd, and S. B. Weiner: Hyaluronidase-Bound Membrane as a Biomaterial for Implantable Fuel Cells 283

H. U. Cameron, R. M. Pilliar, and I. Macnab: The Rate of Bone Ingrowth into Porous Metal 295

W. Rostoker and J. O. Galante: Some New Studies of the Wear Behavior of Ultrahigh Molecular Weight Polyethylene 303

J. J. Klawitter, J. G. Bagwell, A. M. Weinstein, B. S. Sauer, and J. R. Pruitt: An Evaluation of Bone Growth into Porous High Density Polyethylene 311

Issue No. 3, May

Announcement 325

R. A. Moidel, S. K. Wolfson, Jr., R. G. Selker, and S. B. Weiner: Materials for Selective Tissue Heating in a Radiofrequency Electromagnetic Field for the Combined Chemothermal Treatment of Brain Tumors 327

D. M. Robertson, L. St. Pierre, and R. Chahal: Preliminary Observations of Bone Ingrowth into Porous Materials 335

T. A. Krouskop, R. Trono, and A. J. Adamski: The Effects of Pylon Shape on Bone–Pylon Interface Performance in Direct Skeletal Attachment 345

C. F. Timmons, A. L. Hines, G. R. Lightsey, and T. Okabe: Diffusion of Mercury in Ag_2Hg_3 from Weight-Loss Data 371

J. Black: Dead or Alive: The Problem of *in vitro* Tissue Mechanics ... 377

B. F. Matlaga, L. P. Yasenchak, and T. N. Salthouse: Tissue Response to Implanted Polymers: The Significance of Sample Shape... 391

H. L. Miller, W. Rostoker, and J. O. Galante: A Statistical Treatment of Fatigue of the Cast Co-Mr-Mo Prosthesis Alloy..... 399

G. P. Stewart and M. A. Wilkov: Mechanism of Failure of Biocompatible-Treated Surfaces..... 413

J. L. Brash, J. M. Brophy, and I. A. Feuerstein: Adhesion of Platelets to Artificial Surfaces: Effect of Red Cells..... 429

C. M. Baldwin and J. D. Mackenzie: Flame-Sprayed Alumina on Stainless Steel for Possible Prosthetic Application..... 445

H. P. M. Fromageot, J. N. Groves, A. R. Sears, and J. F. Brown, Jr.: The Interaction of Macromolecular Solutions with Macromolecular Monolayers Adsorbed on a Hydrophobic Surface..... 455

E. F. Cuddihy, J. Moacanin, E. J. Roschke, and E. C. Harrison: *In vivo* Degradation of Silicone Rubber Poppets in Prosthetic Heart Valves..... 471

Information for Contributors..... 483

Issue No. 4, July

Biomedical Materials Symposium No. 7
"Materials for Reconstructive Surgery"
D. D. Moyle, S. N. Levine, and F. W. Cooke, Eds.

J. P. Collier, G. A. Colligan, and S. A. Brown: Bone Ingrowth into Dynamically Loaded Porous-Coated Intramedullary Nails..... 485

E. Dörre, D. Geduldig, M. Happel, R. Lade, P. Prüssner, H.-G. Willert, and L. Zichner: Animal Studies on Bone Ingrowth Kinetics of Ceramic Material Under Dynamic Stress..... 493

D C. Greenspan and L. L. Hench: Chemical and Mechanical Behavior of Bioglass-Coated Alumina..... 503

P. Griss, D. C. Greenspan, G. Heimke, B. Krempien, R. Buchinger, L. L. Hench, and G. Jentschura: Evaluation of a Bioglass-Coated Al_2O_3 Total Hip Prosthesis in Sheep..... 511

P. Griss, R. Silber, B. Merkle, K. Haehner, G. Heimke, and B. Krempien: Biomechanically Induced Tissue Reactions after Al_2O_3–Ceramic Hip Joint Replacement. Experimental and Early Clinical Results..... 519

M. B. Habal and V. A. Chalian: Prefabricated Silicone Subdermal Mandibular Implants: Observations and Problems Related to their Application..... 529

W. C. Hayes and D. R. Carter: Postyield Behavior of Subchondral Trabecular Bone 537

A. J. Lozano, H. J. Cestero, Jr., and K. E. Salyer: A Comparative Study of the Early Vascularization of Porous Carbon and Bone as a Graft 545

J. E. Lemons, K. M. W. Niemann, and A. B. Weiss: Biocompatibility Studies on Surgical-Grade Titanium-, Cobalt-, and Iron-Base Alloys .. 549

D. L. Leake and M. B. Habal: Craniofacial Contour Defect Reconstruction with a Dacron/Urethane Composite: An Alloplastic Tray for Bone Induction Fabrication and Application 555

H. E. Kambic, R. J. Kiraly, and Y. Nosé: A Simple *in vitro* Screening Test for Blood Compatibility of Materials 561

J. Pugh, C. Weiss, F. Weiss, and D. Malkin: Design and Biomechanical Evaluation of a Cementable Endosteal Blade Implant 571

J. N. Ross, J. T. M. Wright, S. Eskin, L. von Koch, and N. A. Normann: Oxidized Orlon as a Blood Interface 583

M. Spector, W. R. Flemming, A. Kreutner, and B. W. Sauer: Bone Growth into Porous High-Density Polyethylene 595

P. R. Townsend, R. E. Miegel, R. M. Rose, P. Raux, and E. L. Radin: Structure and Function of the Human Patella: The Role of Cancellous Bone 605

G. E. O. Widera, J. A. Tesk, and E. Privitzer: Interaction Effects Among Cortical Bone, Cancellous Bone, and Periodontal Membrane of Natural Teeth and Implants 613

J. R. de Wijn: Poly(methyl Methacrylate)–Aqueous Phase Blends: *In situ* Curing Porous Materials 625

T. M. Wright and W. C. Hayes: The Fracture Mechanics of Fatigue Crack Propagation in Compact Bone 637

Author Index 649

Issue No. 5, September

Announcements 651

C. N. J. Wagner, A. H. Shabaik, D. J. Schurman, and H. C. Amstutz: Preparation and Characterization of Wear Debris of Orthopedic Materials for Biocompatibility Studies 653

E. J. Sutow, S. R. Pollack, and E. Korostoff: An *in vitro* Investigation of the Anodic Polarization and Capacitance Behavior of 316-L Stainless Steel 671

L. S. Castleman, S. M. Motzkin, F. P. Alicandri, V. L. Bonawit, and A. A. Johnson: Biocompatibility of Nitinol Alloy as an Implant Material 695

H. Shoji, J. F. Nicastro, G. D. Rovere, and A. G. Gristina: *In vitro* Effects of Bone Cement on *S. aureus* Growth and Phagocytosis and Glucose Metabolism of Macrophage: A Preliminary Study 733

J. C. Fu, C. Hagemeir, D. L. Moyer, and E. W. Ng: A Unified Mathematical Model for Diffusion from Drug–Polymer Composite Tablets .. 743

Y. Noishiki: Biochemical Response to Dacron Vascular Prosthesis 759

H. U. Cameron and V. L. Fornasier: The Bone–Metal Interface Following Hip Nailing 769

A. R. Gr enberg and I. Kamel: Polymer–Ceramic Composite for Tooth-Root Implant 777

M. Marek, R. F. Hochman, and T. Okabe: *In vitro* Corrosion of Dental Amalgam Phases 789

T. A. Freitag and S. L. Cannon: Fracture Characteristics of Acrylic Bone Cements. I. Fracture Toughness 805

Notes

A. Gächter, J. Galante, and W. Rostoker: $MP_{35}N$: A Corrosion-Resistant, High-Strength Alloy for Orthopedic or Surgical Implants: Two-Year Bioassay Results 829

Information for Contributors 833

Issue No. 6, November

Announcement 835

E. P. Lautenschlager, G. W. Marshall, K. E. Marks, J. Schwartz, and C. L. Nelson: Mechanical Strength of Acrylic Bone Cements Impregnated with Antibiotics 837

M. Salzer, K. Zweymüller, H. Locke, A. Zeibig, N. Stärk, and G. Punzet: Further Experimental and Clinical Experience with Aluminum Oxide Endoprostheses 847

G. H. Gifford, Jr., E. W. Merrill, and M. S. Morgan: *In vitro* Tissue Reactivity of Radiation-Cured Silicone Rubber Implants 857

D. R. Watts, S. H. Carr, and R. P. Hohf: Poly(glycolic Acid) Structures in Canine Vascular Anastomoses 867

M. A. Schmerling, M. A. Wilkov, A. E. Sanders, and J. E. Woosley: Using the Shape Recovery of Nitinol in the Harrington Rod Treatment of Scoliosis 879

R. M. Pilliar, R. Blackwell, I. Macnab, and H. U. Cameron: Carbon Fiber-Reinforced Bone Cement in Orthopedic Surgery 893

P. F. Johnson and L. L. Hench: An *in vitro* Model for Evaluating Neural Stimulating Electrodes 907

E. P. Lautenschlager, J. J. Jacobs, G. W. Marshall, and P. R. Meyer, Jr.: Mechanical Properties of Bone Cements Containing Large Doses of Antibiotic Powders 929

T. C. Liebert, R. P. Chartoff, S. L. Cosgrove, and R. S. McCuskey: Subcutaneous Implants of Polypropylene Filaments 939

L. Šprincl, J. Exner, O. Štěrba, and J. Kopeček: New Types of Synthetic Infusion Solutions. III. Elimination and Retention of Poly-[*N*-(2-hydroxypropyl)Methacrylamide] in a Test Organism 953

I. K. Cohen, R. F. Diegelmann, and W. S. Wise: Biomaterials and Collagen Synthesis 965

Notes

C. P. W. Chen and E. H. Greener: A Calculation Relating Galvanism and Marginal Breakdown 971

T. E. Hogen-Esch, K. R. Shah, and C. R. Fitzgerald: Development of Injectable Poly(glyceryl Methacrylate) Hydrogels for Vitreous Prosthesis 975

J. M. Brady and D. E. Cutright: Osteogenesis in Ceramic Implantation—A Radioisotope Study 977

Author Index 981

Subject Index 987

Volume Title Page i

Volume Contents iii